

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1.-21. Cancelled.

22. (currently amended) Apparatus for performing start-up AFC during initial cell search (ICS) by a user equipment (UE) receiver, where the ICS comprises:

a Step 1 processor for Step 1 processing of a given sequence;

a first correlator for determining a correlation between said given sequence and a stored sequence;

a second correlator for determining a correlation between said given sequence and the stored sequence which has been altered in phase;

an error estimator for determining the error associated with the outputs of the first and second correlators;

a filter for selectively integrating the error estimate responsive to an initial or steady state conditions of the cell search process; and

one of a voltage controlled oscillator (VCO) and a numeric controlled oscillator (NCO) for adjusting frequency responsive to the integrated error estimate;

~~The apparatus of claim 5,~~ said error estimator further comprising:

means an estimator for providing first, second and third offset estimates; and

means an averager for averaging said first, second and third offset estimates.

23. (previously presented) The apparatus of claim 22 wherein said first, second and third offset estimates are early, punctual and late estimates.

24. (currently amended) The apparatus of ~~claim 22~~ claim 23 wherein the ~~means estimator~~ for providing early, punctual and late offset estimates comprises:

means an early estimator for providing an early estimate which is offset  $-\frac{1}{2}T_C$  relative to the punctual offset estimate and means a late estimator to provide a late offset estimate which is offset  $+\frac{1}{2}T_C$  relative to the punctual offset estimate wherein  $T_C$  is no greater than  $\frac{1}{2}$  of a sampling rate.

25.-26. Cancelled.

27. (currently amended) Apparatus for performing start up automatic frequency control (AFC) during an initial cell search (ICS) by a user equipment (UE) receiver comprising:

~~means a Step 1 processor~~ for performing Step 1 processing of a received code sequence to provide a location of a synchronization channel;

~~processing means processor~~ for producing early, punctual and late frequency offsets based on the received sequence;

first, second and third frequency estimators respectively determining an estimated frequency from said early, punctual and late offsets;

~~means an averager~~ for averaging the estimated frequencies;

a filter for selectively integrating the error estimate; and

~~isolator oscillator~~ (VCO) and a numeric controlled ~~isolator oscillator~~ (NCO) for adjusting frequency of the receiver responsive to the integrated error estimate.

28. (new) A method of performing start-up automatic frequency control (AFC) for use during initial cell search (ICS) processing by a user equipment (UE) receiver, where the ICS processing comprises Step 1 processing of a received primary synchronization code (PSC) sequence, the method comprising:

- (a) receiving said PSC sequence which has a received frequency, and performing Step 1 processing of the received PSC sequence to form a first estimate of the received frequency;
- (b) rotating a phase of a stored sequence at the estimated received frequency plus a given frequency amount, to form an increased rotated phase of the stored sequence;
- (c) rotating a phase of the stored sequence at the estimated received frequency minus the given frequency amount, to form a decreased rotated phase of the stored sequence;
- (d) correlating the received PSC sequence with the increased rotated phase of the stored sequence, and correlating the received PSC sequence with the decreased rotated phase of the stored sequence;
- (e) combining the two correlations from step (d) to form a frequency adjustment value, and
- (f) revising the estimated received frequency and adjusting the UE receiver, responsive to the frequency adjustment value.

29. The method of claim 28, further comprising repeating steps (b) through (f) a preferred number of times.

30. The method of claim 29, wherein the preferred number of times is 24.

31. (new) A user equipment (UE) for performing start-up automatic frequency control (AFC) during initial cell search (ICS) processing according to the method of claim 28, where the ICS processing comprises Step 1 processing of a received primary synchronization code (PSC) sequence, the UE comprising:

- (a) a receiver for receiving said PSC sequence which has a received frequency;
- (b) a Step 1 processor for performing Step 1 processing of the received PSC sequence to form a first estimate of the received frequency;
- (c) a storage device for storing a sequence;
- (d) an increased phase rotator for rotating a phase of the stored sequence at the estimated received frequency plus a given frequency amount, to form an increased rotated phase of the stored sequence;
- (e) a decreased phase rotator for rotating a phase of the stored sequence at the estimated received frequency minus the given frequency amount, to form a decreased rotated phase of the stored sequence;
- (f) a first correlator for correlating the received PSC sequence with the increased rotated phase of the stored sequence;

- (g) a second correlator for correlating the received PSC sequence with the decreased rotated phase of the stored sequence;
- (h) an integrator for combining the two correlations from steps (f) and (g) to form a frequency adjustment value;
- (i) an estimated frequency reviser for revising the estimated received frequency responsive to the frequency adjustment value; and
- (j) a receiver adjuster for adjusting the UE receiver, responsive to the frequency adjustment value.

32. (new) The UE of claim 31, wherein the receiver adjuster of step (j) is one of a voltage controlled oscillator (VCO) and a numerical controlled oscillator (NCO).

33. (new) The UE of claim 31, further comprising a repeater for repeating steps (b) through (f).

34. (new) The UE of claim 33, further comprising a counter whereby steps (b) through (f) are repeated a preferred number of times.